[0049] medical applications such as pressure sensitive bandages, dressings, garments, bed pads, sports braces;

[0050] sport applications such as show sensors, sensors in contact sport (martial arts, boxing, fencing), body armour that can detect and measure hits, blows or strikes, movement detection and measurement in sports garments;

[0051] seat sensors in any seating application for example auditoria and waiting rooms;

[0052] garment and shoe fitting;

[0053] presence sensors, for example under-carpet, in-flooring and in wall coverings.

[0054] Referring to **FIG. 1**, the basic textile switch/sensor device comprises two self-supporting textile electrodes **10,12** sandwiching variably resistive element **14** made by applying to nylon cloth an aqueous suspension of highly void-bearing granular nickel-in-silicone at volume ratio within the composition of 70:1 capable of quantum tunnelling conduction, as described in PCT/GB99/00205. Electrodes **10,12** and element **14** are fixed in intimate contact so as to appear and function as one textile layer. Each electrode **10,12** is conductively linked to a connective textile element **16** consisting of stainless steel thread in nylon tape **18** extending from electrodes **10,12**. When pressure is applied to any area of electrode **10,12** the resistance between them decreases. The resistance between electrodes **10,12** will also decrease by bending.

[0055] Referring to **FIG. 2**, in a variant of the basic textile switch/sensor, upper layer **20** is a non-conducting textile support under which adheres the upper electrode constituted by discrete electrically conductive sub-area **22** conductively linked to connective member **24**, which is a conductive track in extension **26** of support **20**. Variably resistive element **28**, similar to that of element **12** above but containing polyurethane binder, is provided as a coating on lower electrode **29**, the area of which is greater than that of upper electrode **22**. Lower electrode **29** is formed with lower connective member **24**, a conductive track on an extension **26** of electrode **29**. When pressure is applied to sub-are a **22**, the resistance between elements **22** and **29** changes. Effectively this defines a single switching or pressure sensitive area **22** in upper layer **20**.

[0056] Referring to **FIG. 3**, a multiple key textile switch/sensor device is similar in form to that shown in **FIG. 2** except that under upper layer **30** are adhered three discrete electrodes constituted by electrically conductive sub-areas **32,34** and **36** isolated from each other by the non-conducting textile support and electrically linkable to external circuitry by way of connective members **33,35,37** respectively, which are conductive tracks on extension **31** of layer **30**. Variably resistive element **38** is provided as a coating on lower electrode **39**; it is of the type decreasing in resistance when mechanically deformed, since it depends on low or zero conductivity in the plane of element **38**. Electrical connection to lower electrode **39** is by means of conductor **24** and extension **26**, as in **FIG. 2**. When pressure is applied to any of areas overlying electrodes **32,34** and **36**, the resistance between the relevant electrode(s) and lower electrode **39** decreases. Effectively this defines three separate switching or pressure sensitive areas **32,34** and **36**, suitable as individual keys in a textile keypad or individual pressure sensors in a textile sensor pad. If the sensor is to respond to bending, other electrodes in contact with lower layer **39** would be provided to measure changes in conductivity in the plane of that layer; at the same time the external circuit would temporarily switch out the measurement perpendicular to the plane of layer **39**.

[0057] Referring to **FIG. 4**, in a matrix switch/sensor device the upper layer **40** and lower layer **42** each contains parallel linear electrodes consisting of isolated rows **44** and columns **46** of conductive areas woven into a non-conducting textile support. Conductive areas **44, 46** are warp yarns that have been woven between non-conductive yarns. Variably resistive element **48** is a sheet of fabric carrying nickel/silicone QTC granules as in **FIG. 1** applied by padding with an aqueous dispersion of the granules, which are of the type decreasing in resistance on mechanical deformation. Layer **48** is supported between layers **40** and **42** and coincides in area with electrodes **44** and **46**. When pressure is applied to a localised area of **40** or **42** there is a decrease in resistance at the junctions of the conductive rows **44** and columns **46** which fall within the localised area of applied pressure. This device can be used as a pressure map to locate force applied within the area of the textile electrodes. By defining areas of the textile electrodes as keys, this device can also be used as a multi-key keypad.

EXAMPLE

[0058] One electrode is a fabric consisting of a 20 g/m2 knitted mesh containing metallised nylon yarns. The variably resistive element was applied to this-fabric by transfer coating of:

[0059] 75% w/w water based polyurethane (Impranil-Dow chemical); and

[0060] 27% w/w nickel/silicone QTC granules (size 45-70micrometers) and was cured on the fabric at 110° C. The other textile electrode element is another piece of the same knitted mesh. Each electrode was then sewn onto a non-conducting support fabric sheet of greater area than the electrode. The sensor was assembled with the coated side of the first electrode element facing the second electrode. Separate connective textile elements each consisting of metallised nylon thread were sewn up to each electrode so that good electrical contact was made with each. On the non-conducting support fabric outside the electrodes two metal textile press-studs were fixed such that each was in contact with the two conductive yarn tails. An electrical circuit was then connected to the press-studs so that a sensor circuit was completed.

1-14. (Canceled).

15. A variable resistance user-interface comprising:

textile-form flexible conductive electrodes connective to associated circuitry; and

a textile-form variably resistive element capable of exhibiting a change in electrical resistance on mechanical deformation formed as a coating applied to a textile sandwiched between the electrodes.

16. A user-interface according to claim 15 in which at least one electrode is supported on non-conducting textile as conductive yarn woven, knitted or embroidered into the non-conducting textile.